

CLAIMS LISTING

CLAIMS

We claim:

Claims 1-24 (Canceled)

25. (New) A method of identification and quantification of carboxylic acid(s) in a sample comprising the steps of:

- a) combining a known amount of a carboxylic acid ester internal standard with said sample comprising said carboxylic acid ;
- b) contacting said sample with either a chloroformate and an alcohol or a base and an alkyl halide to convert said carboxylic acid in said sample into a carboxylic acid ester of identical structure as that of said carboxylic acid ester internal standard except for the stable isotope atoms;
- c) extracting said sample to isolate said carboxylic acid ester and said carboxylic acid ester internal standard; and
- d) analyzing said carboxylic acid ester and said carboxylic acid ester internal standard by mass spectrometry.

26. (New) The method of claim 25 wherein said mass spectrometric method is the isotope dilution mass spectrometric method using isotope labeled internal standard.

27. (New) The method of claim 25 wherein said carboxylic acid is a carboxylic acid having the following formula $R_1\text{COOH}$ wherein R_1 is alkyl or aryl or heteroatom containing cyclic or non-cyclic group.

28. (New) The method of claim 25 wherein said carboxylic acid ester internal standard is a stable isotope labeled internal standard.

29. (New) The method of claim 25 wherein said carboxylic acid ester internal standard is synthesized by reacting an authentic sample of said carboxylic acid with a stable isotope labeled reagent to form said carboxylic acid ester internal standard having the following formula R_1OCOR_2 wherein R_2 is a stable isotope labeled alkyl group.
30. (New) The method of claim 29 wherein said stable isotope labeled alkyl group R_2 is CD_3 wherein said carboxylic acid is reacted with a chloroformate and a labeled methanol, or with a base and a labeled methyl iodide.
31. (New) The method of claim 29 wherein said stable isotope labeled alkyl group R_2 is CD_2CD_3 wherein said carboxylic acid is reacted with a chloroformate and a labeled ethanol, or with a base and a labeled ethyl iodide.
32. (New) The method of claim 29 wherein said stable isotope labeled alkyl group R_2 is $CD_2C_6D_5$ wherein said carboxylic acid is reacted with a base and a labeled benzyl chloride.
33. (New) The method of claim 25 wherein said extraction step c) can be any appropriate separating methods such as solid phase extraction, liquid-liquid extraction or solid supported liquid-liquid extraction.
34. (New) The method of claim 25 wherein said alcohol is selected from a group consisting of methanol and ethanol.
35. (New) The method of claim 25 wherein said chloroformate is selected from a group consisting of isobutyl chloroformate, methyl chloroformate, and ethyl chloroformate.
36. (New) The method of claim 25 wherein said alkyl halide is selected from a group consisting of methyl iodide, ethyl iodide, and benzyl chloride.
37. (New) The method of claim 25 wherein said base is selected from a group consisting of sodium hydroxide, sodium carbonate, pyridine and triethylamine.

38. (New) The method of claim 25 wherein said sample contains either a singularity or a plurality of said carboxylic acids.
39. (New) The method of claim 25 wherein said multiple carboxylic acids can be converted to said multiple carboxylic acid esters using either a chloroformate and a single alcohol or a base and a single alkyl halide.
40. (New) The method of claim 25 wherein said multiple carboxylic acid ester internal standards can be synthesized using either a chloroformate and a single labeled alcohol or a base and a single labeled alkyl halide.
41. (New) The method of claim 25 wherein there is no conversion of said stable isotope labeled carboxylic acid ester internal standard to its corresponding non-labeled carboxylic acid ester compound during step b).
42. (New) The method of claim 25 wherein said converting step b) is performed in an aqueous environment.
43. (New) The method of claim 25 wherein said converting step b) is performed before said extraction step.
44. (New) The method of claim 25 wherein said converting step b) is quantitative.